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Elements of Physics. By C. HANFORD HENDERSON, Principal Pratt High School, Brooklyn and JOHN F. WOODHULL, Professor of Physical Science, Teacher's College, Columbia University, New York: D. Appleton & Co., 1900. \$1.10.

AMONG the multitude of elementary text-books in physics which have been published during the past few years it is refreshing to find one whose chief aim is not to adorn a disjointed skeleton of incongruous laboratory exercises. The authors of this book have recognized the impossibility of deducing from a limited number of rude experiments those physical facts and principles which the secondary school pupil is able to appreciate and ought to understand. There seems also to be no undue striving for the strikingly original but the essential features of the science are presented in a simple and conventional manner. Wherever possible the effort is made to humanize the subject by showing how man has utilized its principles to procure his own comfort and well-being. This effort to interest seems in some cases to have been carried beyond the bounds of the subject in hand as in the section which deals with the eclipses of the moon and in the chapter on music. These subjects rightly belong to other branches of science. The majority of the side references, however, are well chosen and instructive.

Probably the weakest point in the book is the lack of mathematical presentation. Few of the conclusions or laws are stated in the concise form of the mathematical formula and the mathematical demonstration and solution are rarely used or explained. As physics is inherently a mathematical science it is essential that an elementary text-book should treat it as far as possible mathematically. Higher mathematics must of course be eliminated but algebra and geometry should be called upon wherever needed. This reluctance to apply mathematics is particularly shown in the chapter on light. It would appear here that the position of the image formed by a mirror or a lens is a physiological impression and not a mathematical certainty. If the laws of reflection and refraction as stated are true, then the image of an object must have a definite relation to the object and it is not a case of appearance but of actuality. A statement like the following cannot fail to be misleading. "The image of a straight object appears curved in either convex or concave mirrors only when the object is very near to the mirror." Physiologically it may appear, but physically its condition is certain. This lack of simple geometrical demonstration renders the whole discussion of the formation of images hazy and indefinite.

In the treatment of electricity it is doubtful if any attempt should be made to explain what electricity is. Probably the word ether must of necessity be used, but "an ether vortex, an ether stress, and ether flowing as a stream" are expressions which, if the pupil uses them at all, will be likely to give wrong impressions. If he attempts to base his idea of electricity on his appreciation of the meaning of such phrases electricity will almost inevitably appear to him as a form of mass action and this conception will stand in the way of his farther progress. Probably all that the secondary pupil can possibly do is to get a knowledge of what electricity does and the means by which it is generated. These subjects the authors have discussed in a simple and practical manner steering clear of complicated phenomena and of intricate machines. Since, however, the modern theory of ions is rapidly displacing the older theory of the action which takes place in a battery it would hardly seem best to endeavor to explain this by the use of a chemical equation. It is doubtful also if chemical symbols can properly be used when referring to a mass of substance as "hydrogen, H."

The illustrations are well chosen and admirably adapted to illuminate the difficult points in the text. Many of them are of simple but ingenious apparatus which the pupil can readily make for himself. Another feature of the book which cannot fail to increase its attractiveness is the collection of portraits of notable physicists.

The authors in their preface set themselves the task of preparing a "readable," "informational," "humanized" presentation of the subject of physics. They are to be congratulated on having so well accomplished the task they set themselves. The book can be used to advantage with any laboratory manual to round out a comprehensive course, is suitable for schools that have limited laboratory facilities and will be an excellent book to supplement many of the texts now in use.

WILLIAM H. SNYDER

WORCESTER ACADEMY

Famous Geometrical Theorems and Problems with their History. Parts I and II. Boston. D. C. Heath & Co. 10 cents each.

IN these two pamphlets the author has collected a number of proofs that the sum of the angles of a triangle is two right angles, that the square on the hypotenuse of a right angle is equal to the sum of the squares on the sides, and has made a number of remarks on the quadrature of the circle.

The thing attempted: viz., to supply teachers of mathematics with monographs which will assist them to obtain a more connected view of the elementary part of their science, deserves to be done and to be well done. This end cannot be reached by making a compilation of alternative proofs of propositions or by accumulating personal items which, however interesting, have nothing to do with science. The writer has made both of these mistakes. He gives twenty-six proofs of the proposition on the right triangle, of which four or five are interesting. The really valuable information which he gives on the history of the quadrature of the circle might have been stated in five pages out of the twenty which are given, ten of them being wasted on the vagaries of one circle squarer who happened to be unusually audacious.

A serious defect of these pamphlets is that they are not very clear. The seeker after scientific information will have to hunt it out and piece it together. The author has sought to create interest in mathematics by the help of things outside mathematics and it is natural that he should have neglected what ought to have been his subject. An interest so created will be factitious and in the end disappointing. The preface can however be recommended since it contains a number of references to standard books on the history of mathematics.

J. H. McDONALD

BURLINGTON, IA.

On Southern Poetry Prior to 1860. By S. E. BRADSHAW. The B. F. Johnson Publishing Co., 1900.

On Southern Poetry Prior to 1860 is the title of a thesis presented to the University of Virginia by Sidney Ernest Bradshaw. As published it makes up a volume of 160 pages, including a table of chronology and the bibliography. The period selected for review is from 1607 to 1860—or from the settlement of Jamestown to near the outbreak of the Civil War. Without drawing distinctions too narrowly a southern author is understood to be one who was born or whose work was done or